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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,478	12/05/2003	Sivaram Balasubramanian	99AB083-A (1506.094)	3088
63122 7590 06/23/2010 ROCKWELL AUTOMATION, INC./BF ATTENTION: SUSAN M. DONAHUE, E-7F19 1201 SOUTH SECOND STREET MILWAUKEE, WI 53204				
EXAMINER				
ZHE, MENG YAO				
ART UNIT		PAPER NUMBER		
2195				
NOTIFICATION DATE		DELIVERY MODE		
06/23/2010		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@boylefred.com  
smdonahue@ra.rockwell.com

### Office Action Summary

**Application No.**

10/729,478

**Applicant(s)**

BALASUBRAMANIAN, SIVARAM

**Examiner**

MENGYAO ZHE

**Art Unit**

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 March 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 24, 26-28 and 35-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 24, 26-28, 35-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. Claims 24, 26-28, 35-38 are presented for examination.
2. The applicant is advised to cancel the withdrawn claims 1-23.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 24, 26-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., International Publication No. WO 98/42101 (hereafter Smith) in view of Gulick, Patent No. 6,418,459 (hereafter Gulick) further in view of Schultz et al., Patent No. 5,619,409 (hereafter Schultz).
4. Smith was cited in the previous office action.
5. As per claim 24, Smith teaches a method of coordinating a new control application program with other control application programs being performed on a distributed operating system (Pg 2, lines 1-6), wherein the distributed operating system is for use with a control system having spatially separated control hardware nodes, each node having at least one resource, and the control system further including a network connecting a plurality of hardware nodes (Pg 12, lines 20-25), the method comprising:

executing the operating system on at least one processor of the hardware nodes (Pg 18, lines 7-18);

receiving the new control application program to be registered with the operating system (Fig 2, unit 11; Pg 14, lines 22-27);

identifying at least the first and the second spatially separated control hardware nodes on which the new control application program will execute (Pg 14, line 17-Pg 15, line 9; Table 1);

identifying a portion of the network as required by the new control application program (Table 1: Network connection);

verifying that the new control application program can be executed using the first and second node, and the portion of the network connecting the first and second node while requirements of the other control application programs also are met (Pg 17, lines 20-27).

allocating the new control application program to the identified control hardware resources (Pg 21, lines 6-18).

Smith does not teach that the network connects the first and second node.

However, it would have been obvious to one having ordinary skill in the art at the time of the applicant's invention that the network does connect the nodes, since these nodes are distributed over the network (Fig 3).

Smith does not specifically teach that the operating system is a real-time operating system.

However, since Smith never limits his operating system to be anything specific, and furthermore since real-time operating system are commonly used to minimize latency, it would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Smith with a real-time operating system for the purpose of latency minimization.

Although Smith teaches that resources could be time resources (Column 12, line 1, Pg 15, lines 19-21), Smith does not specifically teach in details that the method further comprises identifying a fixed time interval associated with the new control application program for completing execution of at least a portion of the new control application program, verifying that the program can be executed within the fixed time interval and allocating the program to the resources if it can be executed within the fixed time interval.

However, Gulick teaches identifying a fixed time interval associated with the new control application program for completing execution of at least a portion of the new control application program, verifying that the program can be executed within the fixed time interval and allocating the program to the resources if it can be executed within the fixed time interval (Column 8, lines 1-5; Column 8, line 55-Column 9, line 4; Column 11, lines 45-61) for the purpose of meeting a program's timing constraints.

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Smith with identifying a fixed time interval associated with the new control application program for completing execution of at least a portion of the new control application program, verifying that the program can

be executed within the fixed time interval and allocating the program to the resources if it can be executed within the fixed time interval, as taught by Gulick, because this allows the system to best satisfy a task's timing needs.

Smith in view of Gulick does not specifically teach that the control hardware nodes are industrial controllers.

However, Schultz teaches scheduling processes onto industrial controllers for the purpose of real time control (Abstract; Column 1, lines 6-10).

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Smith in view of Gulick with the specifics of having processes run on industrial controllers, as taught by Schultz, such that the application program may run on the controllers, because it allows for real time control of the applications.

6. As per claim 26, Smith teaches collecting statistics regarding a usage of the control hardware resources as the new control application program and other control application programs are being performed; and optimizing the usage of the control hardware resources based at least in part upon the collected statistics (Pg 39, line 21-Pg 41, line 5).

7. Claims 27-28, 35-38 rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al., International Publication No. WO 98/42101 (hereafter Smith) in view of

Gulick, Patent No. 6,418,459 (hereafter Gulick) further in view of Schultz et al., Patent No. 5,619,409 (hereafter Schultz), as applied to claim 24 above, further in view of Kim et al., Patent No. 4,625,308 (hereafter Kim).

8. As per claims 27, 35, 36, Smith further teaches maintaining a resource list identifying the utilization of the memory devices, the processor, and the communication means of each industrial controller and the utilization of the network connections between each of the industrial controllers (Table 2).

Smith in view of Gulick further in view of Schultz does not specifically teach maintaining a topology map identifying the network connections between each of the industrial controllers.

However, Kim teaches maintaining a topology map identifying the network connections between nodes (Fig 23; Column 11, lines 5-13) for the purpose of network control and monitoring.

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention to modify the teachings of Smith in view of Gulick further in view of Schultz with the specifics of maintaining a topology map identifying the network connections between each of the industrial controllers, as taught by Kim, because it allows for the network to be monitored and controlled.

9. As per claim 28, Smith teaches wherein the high-level requirements include at least one of a hardware requirement, a completion-timing constraint, a message size, an inter-arrival period, a need for remote system services, and a type of priority (Pg 15, lines 19-21; Pg 41, line 20).

10. As per claim 37, Smith in view of Guillick further in view of Schultz further in view of Kim does not specifically teach wherein a portion of the fixed completion time is allocated to the network connections. However, since Smith does teach that a fixed completion time is allocated to the requester and that the requester does request for network services (Pg 12, line 1, Pg 15, lines 19-21), it would have been obvious to one having ordinary skill in the art at the time of the applicant's invention that the time is the indirectly allocated to the network required by the requester.

11. As per claim 38, Smith teaches that the nodes are connected to control signals (Pg 16, lines 15-20). Kim teaches that the nodes may be industrial controllers (Abstract; Column 1, lines 6-10).

### ***Response to Arguments***

12. Applicant's arguments with respect to claims 24, 26-28, 35-38 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP



§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MENGYAO ZHE whose telephone number is (571)272-6946. The examiner can normally be reached on Monday Through Friday, 7:30 - 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on 571-272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Meng-Ai An/  
Supervisory Patent Examiner, Art Unit 2195

/Mengyao Zhe/